8.0 DETAILED ANALYSIS OF ALTERNATIVES

The five alternatives proposed in Section 7 are evaluated on the basis of the criteria presented in Section 5.

8.1 Alternative 1: Building Demolition, Capping, and Institutional Controls

Threshold Requirements

Protect Human Health and the Environment

The cap would prevent direct contact with and ingestion of PCB-contaminated soils. Together with institutional controls to prevent unmanaged ground intrusive activities and to limit the use of the site to industrial, this alternative would protect human health and the environment. However, since soils with high PCB concentration would still remain on site, potential future health risks and the potential for future migration of chemical to the ground water would not be eliminated.

Comply with Cleanup Standards

Cleanup levels would not be met at the point of compliance from the ground surface to fifteen feet below the ground surface. However, under WAC 173-340-740(6)(f), for cleanup actions that involve containment, the cleanup action may be determined to comply with cleanup standards, provided:

- The selected remedy is permanent to the maximum extent practicable;
- The cleanup action is protective of human health and the environment;
- The cleanup action is demonstrated to be protective of terrestrial ecological receptors;
- Institutional controls are put in place;
- Compliance monitoring and periodic reviews are designed to ensure the long-term integrity of the containment system;
- The types, levels, and amount of hazardous substances remaining on-site and the measures that will be used to prevent migration and contact with those substances are specified in the draft cleanup action plan.

Therefore cleanup standards would be complied with if this alternative is determined to be permanent to the maximum extent practicable. All the other above criteria would be met for this alternative.

Comply with Applicable State and Federal Law

All other ARARs listed in Table 5 could be complied with.

Provide for Compliance Monitoring

This alternative would provide for periodic inspection and maintenance of the gravel cap. This would ensure that the long-term integrity of the cap for the cleanup action is effective over time.

Other Requirements

Use Permanent Solutions to the Maximum Extent Practicable

(i) Protectiveness: This alternative would be protective of human health and the environment.
(ii) Permanence: No reduction of toxicity, mobility, or volume of PCBs would be achieved under this alternative.
(iii) Cost: The capital cost and annual operation and maintenance costs for this alternative are given in Table 6. All costs are calculated on a present worth basis. The present value of Alternative 1 is $209,731.
(iii) Effectiveness over the long term: This alternative would rank very low in effectiveness over the long term because this involves no treatment that would reduce the toxicity, mobility, or volume of PCBs. Containment with attendant engineering controls rank very low when assessing the relative degree of long-term effectiveness under WAC 173-340-360(3)(e)(iv).
(iv) Management of short-term risks: There would be minimal risk to human health and the environment associated with this alternative during implementation of this alternative. Maintenance workers could be reliably protected through the use of standard safety equipment.
(v) Technical and administrative implementability: This alternative could be easily accomplished.
(vi) Consideration of public concerns: The public would have an opportunity to comment on this alternative.

Provide for Reasonable Restoration Time Frame

Under this alternative, the PCBs would not be removed or destroyed but would be contained with attendant engineering controls. The PCBs are not expected to undergo natural or chemical degradation at a reasonable rate. This alternative would rank very low in terms of providing for a reasonable restoration time frame.

Consider public concerns

Public concerns would be addressed during the public review and comment period for the draft Feasibility Study Report.

Expectations for cleanup action alternatives

Alternative 1 would not meet Ecology's expectation that for sites containing small volumes of hazardous substances, all hazardous substances will be destroyed, detoxified,

and/or removed to concentrations below cleanup levels in order to minimize the need for long-term management of contaminated materials.

8.2 Alternative 2: Building Demolition, In-situ Solidification/Stabilization, and Institutional Controls

Threshold Requirements

Protect Human Health and the Environment

This alternative would solidify impacted on-site soil and would be covered with clean soil, therefore eliminating direct contact with and ingestion of the soils. The treated soils would remain on-site, but would no longer pose a threat to human health or the environment. Institutional controls would be needed to prevent unmanaged disturbance of the solidified soil.

Comply with Cleanup Standards

Cleanup standards would not be attained at the point of compliance. PCBs are not completely destroyed by this technology. Because PCBs would still be present in the stabilized soils, long-term management controls in the form of institutional controls are required. Like Alternative 1, this alternative would comply with cleanup standards under WAC 173-340-740(6)(f) if it is determined that this alternative is permanent to the maximum extent practicable.

Comply with Applicable State and Federal Laws

Incineration of the liquid PCBs and the sediments will meet TSCA requirements. All other ARARs listed in Table 5 could be complied with.

Provide for Compliance Monitoring

This alternative would provide for periodic inspection of the soil cover and the solidified soil to ensure its integrity. Deed restrictions on the property to limit site use and to protect the integrity of the soil cover would be required.

Other Requirements

Use permanent solutions to the maximum extent practicable

(i) Protectiveness: This alternative would be protective of human health and the environment.
(ii) Permanence: The PCBs would not be destroyed but its mobility would be greatly reduced. This alternative offers less permanence when compared with alternatives that permanently destroys PCBs.

(iii) Cost: The capital cost and operation and maintenance costs are given in Table 7. All costs are calculated on a present worth basis. The total present value of Alternative 2 is $385,222.

(iii) Effectiveness over the long term: This alternative affords less long-term effectiveness than alternatives that permanently destroy PCBs although this has higher effectiveness over the long term than Alternative 1 because the mobility of PCBs would be reduced. Immobilization or solidification ranks third in assessing the relative degree of long-term monitoring effectiveness under WAC 173-340-360(3)(e)(iv).

(iv) Management of short-term risks: This alternative would have some exposure risk during implementation like exposure to dusts and volatilized PCBs during heating and mixing with the agents. These exposure risks could easily be controlled and mitigated.

(v) Technical and administrative implementability: In-situ solidification/stabilization had already been demonstrated in other Sites. The size of the site area (less than an acre) could pose a challenge as far as accommodation of an in-situ system.

(vi) Consideration of public concerns: The public would have an opportunity to comment on this alternative.

Provide for reasonable restoration time frame

This alternative would stay protective of human health and the environment as long as long-term management controls are maintained. PCBs would still remain with the solidified soils and are not expected to degrade by natural processes. This alternative would also rank low in terms of providing for a reasonable restoration time frame but would rank a little higher than Alternative 1 since the PCBs are demobilized.

Consider public concerns

Public concerns would be addressed during the public review and comment period for the draft Feasibility Study Report.

Expectations for cleanup action alternatives

Alternative 2 would not meet Ecology's expectation for sites containing small volumes to have hazardous substances destroyed, detoxified, and/or removed to concentrations below cleanup levels in order to minimize the need for long-term management of contaminated materials.

8.3 Alternative 3: Deferred Building Demolition, Excavation, Off-site Disposal, and Institutional Controls

Threshold Requirements

Protect human health and the environment

Under this alternative, soils containing PCBs above industrial cleanup levels of 10 mg/Kg would be removed and backfilled with clean soils. The building would not be removed during initial implementation of cleanup; it is assumed that the building would be demolished sometime in the future. However, the dry wells, the underground storage tank, and the drain lines would be removed during the initial stages of the cleanup. There would no longer be any potential for direct contact with PCBs at the Site and the potential for future migration of PCBs to ground water is mostly eliminated. Contaminated soils would be disposed of in a TSCA-permitted landfill; the PCBs would thus be contained and monitored off-site. There would be little or no risk of degrading the environment surrounding the disposal facility since the TSCA-permitted facility is securely isolated and monitored.

Comply with cleanup standards

Industrial cleanup levels would be attained at the point of compliance under this alternative for the City Parcel and the City of Spokane properties, except for the contamination underneath the building. Unrestricted soil cleanup level of 1 mg/Kg would not be met at the point of compliance for the alleyway; however, cleanup standards could be complied with under WAC 173-340-740(6)(f).

Comply with applicable state and federal law

Off-site disposal of PCB-contaminated soils in a permitted landfill, and the incineration of the PCB liquid and sediments would meet the TSCA action ARARs. Other ARARs that could be complied with for this alternative are listed in Table 5.

Provide for compliance monitoring

Protection monitoring would be conducted during excavation and loading to confirm that human health and the environment are adequately protected. Confirmation soil sampling would be conducted to verify that soil cleanup levels are met.

Other Requirements

Use Permanent Solutions to the Maximum Extent Practicable

(i) Protectiveness: This alternative would be protective of human health and the environment.
(ii) Permanence: This alternative would be a permanent remedy.
(iii) Cost: The capital cost and operation and maintenance costs are shown in Table 8. The total present value of Alternative 3 is $748,216 which includes the cost of building demolition and associated soil cleanup (see Table 11) in year 10.
(iv) Effectiveness over the long term: Off-site disposal in an engineered, lined and monitored facility is third in the descending order in the assessment of

the relative degree of long-term effectiveness under WAC 173-340-360(3)(e)(iv).

(v) Management of short-term risks: Risks during excavation, loading, and transporting of PCB-contaminated soils could be controlled. During the excavation and loading activities, dust could impact the surrounding community. Dust control methods could be easily implemented. Air monitoring could be conducted to ensure that fugitive dust would not pose a threat to the community. Risks incurred by offsite transport due to potential for spills or accidental loss of materials could be easily mitigated.

(vi) Technical and administrative implementability: Excavation, hauling, and backfilling operations of soils can be easily implemented. Off-site disposal would occur at an existing permitted off-site facility. However, removal of the DW2 and the underground storage tank would be difficult due to space constraints inside the building; special equipment would be required or portion of the building would have to be destroyed and replaced.

(vii) Consideration of public concerns. The public would have an opportunity to comment on this alternative.

Provide for reasonable restoration time frame

Cleanup levels would be achieved after excavation and backfilling with clean soils in the north parking lot. However, there may still be additional soils that are contaminated under the building that would have to be addressed when the building is demolished.

Consider public concerns

Public concerns would be addressed during the public review and comment period for the draft Feasibility Study Report.

Expectations for cleanup action alternatives

Alternative 3 would partially meet Ecology's expectation that for sites containing small volumes of hazardous substances, all hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels in order to minimize the need for long-term management of contaminated materials.

8.4 Alternative 4: Building Demolition, Excavation, Off-Site Disposal, and Institutional Controls

Threshold Requirements

Protect human health and the environment

All PCB-contaminated soils with concentrations above the industrial cleanup level in the Site would be excavated and disposed off-site in a TCSA permitted landfill. This would

provide a high level of protection of human health and the environment. Remedial action objectives would be met with a high degree.

Comply with cleanup standards

Cleanup levels would be attained at the point of compliance in the City Parcel property.

Comply with applicable state and federal law

Off-site disposal of PCB-contaminated soils in a permitted landfill and the incineration of liquid PCBs and sediments would meet the TSCA action ARARs. Other ARARs that are listed in Table 5 could be complied with.

Provide for compliance monitoring

Protection monitoring would be conducted during building demolition, excavation and loading to confirm that human health and the environment are adequately protected. Confirmation soil sampling would be conducted to verify that soil cleanup levels are met.

Other Requirements

Use permanent solutions to the maximum extent practicable

(i) Protectiveness: This alternative would provide a very high degree of protection of human health and the environment.
(ii) Permanence: This alternative would be a permanent remedy.
(iii) Cost: The capital cost, and operation and maintenance costs are given in Table 9. The total present value of Alternative 4 is $649,465.
(iv) Effectiveness over the long-term. Off-site disposal in an engineered, lined and monitored facility is third in the descending order in the assessment of the relative degree of long-term effectiveness under WAC 173-340-360(3)(e)(iv). This alternative would rate a little higher than Alternative 3 because the building and any additional contaminated soil underneath it would be removed.
(v) Management of short-term risks. Short-term risks for this alternative are similar to those under Alternative 3, with the addition of risks posed during building demolition. All short-term risks could be easily controlled during the construction period.
(vi) Technical and administrative implementability: Like Alternative 3, excavation, hauling, and backfilling operations of soils could be easily implemented. Off-site disposal would occur at an existing permitted off-site facility.
(vii) Consider public concerns: The public would have an opportunity to comment on this alternative.

Provide for reasonable restoration time frame

Cleanup levels at the Site would be achieved after excavation and backfilling with clean soils.

Consider public concerns

Public concerns would be addressed during the public review and comment period for the draft Feasibility Study Report.

Expectations for cleanup action alternatives

Alternative 4 would meet Ecology's expectation that for sites containing small volumes of hazardous substances, all hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels in order to minimize the need for long-term management of contaminated materials.

8.5 Alternative 5: Building Demolition, Excavation, Off-site Incineration, and Institutional Controls

Threshold Requirements

Protect human health and the environment

All contaminated soils in the Site with PCB concentration higher then 10 mg/Kg would be excavated. The PCB contaminated soils would be sent to an off-site incinerator. This would provide a very high level of protection of human health and the environment. Remedial action objectives would be met with a high degree.

Comply with cleanup standards

Cleanup levels would be attained at the point of compliance for the City Parcel Property. For the alleyway, cleanup levels would not be attained at the point of compliance; however, cleanup standards could be complied with under WAC 173-340-740(6)(f).

Comply with applicable state and federal law

Off-site incineration in a TSCA-permitted facility would meet the TSCA action ARARs. Other ARARs that could be complied with for this alternative are listed in Table 5.

Provide for compliance monitoring

Protection monitoring would be conducted during building demolition, excavation and loading to confirm that human health and the environment are adequately protected. Confirmation soil sampling would be conducted to verify that soil cleanup levels are met.

Other Requirements

Use permanent solutions to the maximum extent practicable

(i) Protectiveness: This alternative would provide a very high degree of protection of human health and the environment.
(ii) Permanence: This alternative would be a permanent remedy.
(iii) Cost: The capital cost, and operation and maintenance costs are given in Table 10. The total present value of the alternative is $5,044,372.
(iv) Effectiveness over the long-term. Incineration would destroy the PCBs and thus ranks second (after reuse and recycling) in the descending order in the assessment of the relative degree of long-term effectiveness under WAC 173-340-360(3)(e)(iv). This alternative would rank the highest in terms of effectiveness over the long-term.
(v) Management of short-term risks. Short-term risks for this alternative are similar to those under Alternative 4. All short-term risks could be easily controlled during the construction period.
(vi) Technical and administrative implementability: Like Alternative 3, excavation, hauling, and backfilling operations of soils can be easily implemented. Off-site disposal would occur at an existing permitted off-site incinerator
(vii) Consider public concerns: The public would have an opportunity to comment on this alternative.

Provide for reasonable restoration time frame

Cleanup standards would be complied with at the Site after excavation and backfilling with clean soil and deed restrictions are in place.

Consider public concerns

Public concerns would be addressed during the public review and comment period for the draft Feasibility Study Report.

Expectations for cleanup action alternatives

Alternative 5 would meet Ecology's expectation that treatment technologies will be emphasized and that for sites containing small volumes of hazardous substances, all hazardous substances will be destroyed, detoxified, and/or removed to concentrations below cleanup levels in order to minimize the need for long-term management of contaminated materials.